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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/800,507	03/08/2001	Fumio Arakawa	XA-9454	5102
181	7590	05/26/2005	EXAMINER	
MILES & STOCKBRIDGE PC 1751 PINNACLE DRIVE SUITE 500 MCLEAN, VA 22102-3833			MAI, TAN V	
			ART UNIT	PAPER NUMBER
			2193	

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/800,507

Applicant(s)

ARAKAWA ET AL.

Examiner

Tan V. Mai

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 1/3/05 & 1/31/05.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.  
4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.  
5) ☒ Claim(s) 5-7 is/are allowed.  
6) ☒ Claim(s) 8-12 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

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1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makineni et al (recorded reference).

Makineni et al have been discussed in the previous office (Paper mailed 8/31/04).

As per independent claim 8, the amended claim adds **"with a single execution of said instruction"**; however, the feature is old and well known in the art, e.g., see Col. 1, section "2. Background Art", first paragraph:

"[p]rocessor designers are always looking for ways to enhance the performance of microprocessors. Processing multiple operands in parallel provides one avenue for gaining additional performance from today's highly optimized processors. In certain common mathematical calculations and graphics operations, the same operation(s) is performed repeatedly on each of a large number of operands. For example, in **matrix multiplication**, the row elements of a first matrix are multiplied by corresponding column elements of a second matrix and the resulting products are summed (multiply-accumulate). By providing appropriate scheduling and execution resources, multiply-accumulate operations may be implemented concurrently on multiple sets of row-column operands. This approach is known as vector processing or single instruction, multiple data stream (SIMD) processing to distinguish it from scalar or single instruction, single data stream (SISD) processing."

It is noted that Makineni et al do not specifically detail the claimed "product of matrix data and vector data"; however, the "matrix" can be represented as "vector" (see Kotlov, col. 41-44). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to design the claimed invention according to Makineni et al's teaching because the reference is a data processor capable of performing matrix multiplication as claimed.

As per dependent claim 9, the claim adds "plurality of floating-point execution units". The **"vector processing or single instruction, multiple data stream (SIMD) processing"** should have the claimed feature.

As per dependent claim 10, the claim adds sizes of matrix and vector. The feature is obvious design choice.

As per dependent claim 11, the claim adds "calculating a sum of inner product and scalar data". Matrix multiplication should has the feature.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Makineni et al (recorded reference) as applied to claim 11 above, and further in view of either Steigerwalt, Jr. (recorded reference) or Kojima et al (recorded reference).

As per dependent claim 12, the claim add the "9 input adder". The feature is old and well known in the adder art. For example, Steigerwalt, Jr. or Kojima et al. disclose "**multiple input adders**". It would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine either Steigerwalt, Jr. or Kojima et al in Makineni et al, thereby making the claimed invention, because the reference is a data processor capable of performing matrix multiplication having multiple input adders as claimed.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cited references are art of interest.

5. The following is an examiner's statement of reasons for allowance: the recorded references do NOT teach or suggest the novel "calculate an inner product of two vectors and to sum said inner product with scalar data, with a single execution of said instruction" feature as recited in independent claim 5.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tan V. Mai whose telephone number is (571) 272-3726. The examiner can normally be reached on Mon-Wed and Fri. from 9:30am to 2:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki, can be reached on (571) 272-3719. The fax phone number for the organization where this application or proceeding is assigned is:

Official (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2100.



Tan V. Mai  
Primary Examiner